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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GOOD JOHNSON, MOTILEWA	
ART UNIT	**PAPER NUMBER**
2677	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,384	ZIOBRO, JAMES M.	
	Examiner	Art Unit	
	Motilewa Good-Johnson	2677	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 4-6, 10-15 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee, U.S. Patent 5,418,895, in view of Isemura et al., U.S. Patent 5,726,781.

Regarding claim 4, Lee discloses a method for rendering an image described in a multi-color color space (col. 1, lines 14-19), the method comprising: collecting histogram information from the multi-color color space image (col. 5, lines 26-29) wherein bins within the histogram classify image pixels based on luminance information and hue information (col. 5, lines 26-47); classifying peaks within the histogram that have similar luminance as conflicting colors (col. 6, lines 8-18)

However, it is noted that Lee fails to disclose rendering a color image into a single colorant space, applying at least one distinct spatial modulation to, and only to, at least one representative single colorant version of at least one of the conflicting colors, thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image.

Isemura discloses image processing in which color images are converted into monochrome images for printing on a monochromatic printer or other monochrome output device, see abstract. Isemura further discloses allowing a user to specify patterns associated with a given color and to print the color image in monochrome graphic pattern. Isemura further disclose using a histogram with frequencies of hue, col. 17, lines 30-36.

Isemura discloses rendering a color image into a single colorant space (col. 1, lines 63-67, a monochrome system which produces, which Examiner interprets as renders, images for accurate recognition of colors in the image of the original), applying at least one distinct spatial modulation (figure 42, col. 19, line 59 – col. 20, line 3, graphic monochrome patterns, which Examiner interprets as spatial modulation) to, and only to, at least one representative single colorant version of at least one of the colors (figure 9a, col. 10, lines 5-11), thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image (col. 10, lines 5-11)

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the luminance histogram created in Lee, for allocating colors according to a dynamic range, with the hue histogram that further applies a spatial modulation, i.e. graph monochrome pattern, as disclosed in Isemura, to allow for accurate recognition of color in images of original images in full representation when the image is reproduced in a monochromatic output device, such as a printer, copier, or the like.

Regarding claim 5, Lee discloses before classifying, locating peaks within the histogram data (col. 5, lines 44-50, the peak in the histogram are detected and then the peak is used as the centers for clustering, which Examiner interprets as classifying)

Regarding claim 6, Isemura discloses applying spatial modulation further comprises associating a unique modulation to the single colorant versions of each of the conflicting colors (figure 42)

Regarding claim 10, Lee discloses an image analyzer operative to find and classify conflicting colors in the color image; (col. 5, lines 26-57)

However, it is noted that Lee fails to disclose an image processor operative to generate a single colorant version of a color image, a gray scale modulator operative to add spatial modulations to single colorant versions of only the conflicting colors within the single colorant version of the color image.

Isemura discloses an image processor (302) operative to generate a single colorant version of a color image, a gray scale modulator (302c, patterning circuit, which Examiner interprets as gray scale modulator) operative to add spatial modulations to single colorant versions of only the conflicting colors within the single colorant version of the color image (figure 42, col. 19, line 59 – col. 20, line 3)

It would have been obvious to one of ordinary skill in the art at the time of the invention to include applying a spatial modulation to one representative color of the

conflicting color, as Isemura teaches, in the system of Lee to allow for accurate recognition of color in images of original images in full representation when the image is reproduced in a monochromatic output device, such as a printer, copier, or the like.

Regarding claim 11, Lee discloses a histogram collector operative to classify pixels in the color image based on a characteristic that is also used to generate the single colorant version . . . (col. 5, lines 50-57)

Regarding claim 12, Lee discloses a conflicting color detector operative to examine the histogram and find pixels that are similar with respect to the characteristic that is used to generate the single colorant version . . . (col. 6, lines 8-17)

Regarding claim 13, Lee discloses a color relationship discriminator operative to receive conflicting color classification information from the image analyzer and color image pixel information . . . (col. 5, lines 21-34)

Regarding claim 14, Isemura discloses a spatial modulation attenuator operative to attenuate a gray scale modulation based on the relationship between the color image pixel and the conflicting color (col. 17, lines 37-47)

Regarding claim 15, Isemura discloses a spatial modulation generator operative to generate a gray scale modulation for application to a single colorant version of a color (col. 18, lines 17-28)

Regarding claim 19, Lee discloses that the image processor further comprises an image receiver (element 12)

Regarding claim 20, Isemura discloses image receiver further comprises a xerographic printer (figures 2 and 3)

Regarding claims 21-23, they are rejected based upon similar rational as above claims 4-6 respectively.

3. Claims 7-9 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and Isemura as applied to claims 1 and 13 above, and further in view of Ichikawa, U.S. Patent Number 5,612,792.

Lee discloses a method for rendering an image described in a multi-color color space (col. 1, lines 14-19), the method comprising: collecting histogram information from the multi-color color space image (col. 5, lines 26-29) wherein bins within the histogram classify image pixels based on luminance information and hue information (col. 5, lines 26-47); classifying peaks within the histogram that have similar luminance as conflicting colors (col. 6, lines 8-18)

Isemura discloses image processing in which color images are converted into monochrome images for printing on a monochromatic printer or other monochrome output device, see abstract. Isemura further discloses allowing a user to specify patterns associated with a given color and to print the color image in monochrome graphic pattern. Isemura further disclose using a histogram with frequencies of hue, col. 17, lines 30-36, rendering a color image into a single colorant space (col. 1, lines 63-67, a monochrome system which produces, which Examiner interprets as renders, images for accurate recognition of colors in the image of the original), applying at least one distinct spatial modulation (figure 42, col. 19, line 59 – col. 20, line 3, graphic monochrome patterns, which Examiner interprets as spatial modulation) to, and only to, at least one representative single colorant version of at least one of the colors (figure 9a, col. 10, lines 5-11), thereby ensuring that all single colorant versions of colors in the image are visually distinguishable from one another while minimizing distortions in a remainder of the single colorant version of the image (col. 10, lines 5-11)

However, it is noted that both Lee and Isemura both fail to disclose measuring a color distance between at least one pixel in the image and at least one conflicting color; and applying an attenuated spatial modulation to at least one pixel in the single color and version of the image, the attenuation ranging form zero to one hundred percent of a reference modulation, the level of attenuation being a function of the measured color distance.

Ichikawa discloses measuring a color distance between at least one pixel in the image and at least one conflicting color; and applying an attenuated spatial modulation

to at least one pixel in the single color and version of the image, the attenuation ranging form zero to one hundred percent of a reference modulation, the level of attenuation being a function of the measured color distance (col. 13, lines 32-65, generating a histogram in which boundaries are determined for the color values, and further generating densities and predetermined patterns for the selected for colors having different density values, figure 20A)

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the luminance histogram created in Lee, for allocating colors according to a dynamic range, with the hue histogram that further applies a spatial modulation, i.e. graph monochrome pattern, as disclosed in Isemura, to allow for accurate recognition of color in images of original images in full representation when the image is reproduced in a monochromatic output device, such as a printer, copier, or the like. It further would have been obvious to one of ordinary skill in the art to include in the reproduced monochrome patterns generated in Lee and Isemura, varying the density level, which Examiner interprets as attenuating the spatial modulation, to allow for further distinguish between images having the same color but different density levels, to represent a full-color image with different patterns, because colors are known in the art to have various densities.

Regarding claim 8, 9 and 16-18, they are rejected based upon similar rationale as above claim 7.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa Good-Johnson whose telephone number is (571) 272-7658. The examiner can normally be reached on Monday, Tuesday and Wednesday 9:00 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Motilewa Good-Johnson
Examiner
Art Unit 2677

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